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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,482	06/14/2007	Christopher Toumazou	18655-232590	2201

26694 7590 05/11/2010
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EXAMINER	
STOUT, MICHAEL C	
ART UNIT	PAPER NUMBER
3736	
MAIL DATE	DELIVERY MODE
05/11/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/582,482	TOUMAZOU ET AL.	
	Examiner	Art Unit	
	MICHAEL C. STOUT	3736	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 February 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12, 16-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12 and 16-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This detailed action is in regards to United States Patent Application 10/582,482 filed on 6/14/2007 and is a final action based on the merits of the application. Response to Non-Final document(s) filed on 2/1/2010 is/are being considered by the examiner. The Reindle reference of the previous office action was inserted due to a clerical error and was not referenced in the rejection and has been corrected in the office action.

Claim Objections

Claims 12 and 20 are objected to because of the following informalities: Claims 12 and 20 recite "a method of monitoring pressure within a human or animal body wherein". Wherein clauses may raise a question as to the limiting effect of the language in the claim, see MEPE 2111.04.

The Examiner suggests the use of a non-limiting transitional phrase such as "comprising" for the transitional phrase following the preamble.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

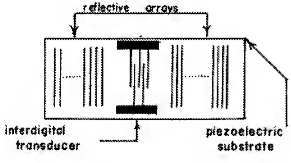
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 12, 16, 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Das et al. "A pressure Sensing acoustic surface wave resonator," 1976 Ultrasonic's Symposium Proceedings, IEEE Cat. No. 76 Ch1120-5SU in view of Weissman et al. (US 6,330,885) and Corl et al. (US 6,767,327).

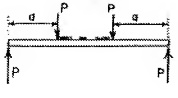
Regarding claim 12, Das discloses a method of monitoring pressure within a human or animal body wherein an acoustic wave device is implanted therein or attached thereto (SAW pressure sensor which is implantable to measure physiological conditions, see Introduction), wherein the device comprises an interdigitated transducer on the surface of a piezo-electric substrate (as best shown in Figures 1 and 2 below the sensor comprises interdigital transducers disposed on a piezoelectric substrate, see Experiment)

FIGURE 1



A TWO-PORT SAW RESONATOR

FIGURE 2



that is placed over a chamber to form a transducer body (see below figure 3 wherein the substrate is placed over an aluminum test base), which substrate is exposed to the pressure to be monitored (see Experiment and Figure Mechanical

loading of Resonator), wherein a radio frequency is used to oscillate and transmit a signal, (see introduction), a signal is transmitted as an acoustic wave in at least one of the following ways 1) over the substrate surface and 2) though the substrate to a reflector on the surface (the waves are transmitted to the reflectors, reflected therefrom back to the transducer (the reflectors reflect the acoustic waves, see Abstract, and theory, see also Figure 1), whereby comparison of the supplied and received signals provides a measurement of pressure difference across the substrate (the pressure results in a change in wave velocity which allows for comparison between the applied load and frequency shift).

Das teaches the use of radio frequencies to oscillate the resonator and transmit a signal but is silent regarding the method wherein an antenna is connected to the interdigitated transducer (60, Column 4, lines 38-48 and 60-58 and column 5, lines 28-53), wherein a radio-frequency signal is supplied externally of the body to the antenna (Column 4, lines 38-48 and 60-58 and column 5, lines 28-53) wherein the transducer transmits information via the antenna to a receiver.

Weissman teaches a method of implanting a SAWS sensor and monitoring a pressure, see column 2, lines 25-35) comprising an antenna is connected to the interdigitated transducer (transmitter connected to the electrodes 70 and 72, see column 6, lines 5-23, see also, Column 4, lines 38-48 and 60-58 and column 5, lines 28-53), wherein a radio-frequency signal is supplied externally of the body to the antenna (Column 4, lines 38-48 and 60-58 and column 5, lines 28-53, column 6, lines 5-23)

wherein the transducer transmits information via the antenna to a receiver (the exciter/interrogator unit 38, see column 4, lines 4-60).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the method taught by Das to include an antenna and interrogator as taught by Weissman in order to remotely collect diagnostic data from the implanted sensor.

Das is further silent regarding the method of monitoring an internal pressure wherein the sensor diaphragm encloses a sealed chamber.

Corl teaches an implanted pressure sensing method wherein the sensor dipahram 79 encloses a sealed cavity 101 which serves as reference pressure chamber and can be filled with a suitable fluid. For example, it can be filled with air to half an atmosphere to provide a partial vacuum. Alternatively, the cavity 101 can be filled to one atmosphere or it can be completely evacuated, see Column 6, lines 24-45.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the method taught by Das to include a reference pressure chamber as taught by Corl in order to measure changes in pressure differential across a sensing diaphragm as the differential between an environmental pressure change vs. a given reference pressure, which can then be used to determine relative vs. absolute pressure.

Regarding claim 16, Das in view of Weissman further teaches the method wherein the pressure is monitored by determination of a delay of the acoustic wave (the signal is transmitted and reflected back to the transducer Das teaches that a change in

load results in a change in the velocity or speed at which a signal is reflected resulting in a frequency shift which (which is a delay in the time domain), see Theory section, and Weisssman teaches a method wherein the pressure gradient, can also be related to the wave speed, frequency or phase of the SAW sensor 54 output. Accordingly, by analyzing the wave speed, frequency or phase of the SAW sensor 54 output based on a predefined criteria similar results may be obtained, the measurement of the speed at which the applied signal transmits across the SAW device and is output from the sensor has the SAW device functioning as a delay line, see column 5, lines 45-54 and column 6, lines 23-45).

Regarding claim 17, Das in view of Weissman further teaches the method wherein the pressure is monitored by determination of the change of resonant frequency of the acoustic wave (Das teaches that a change in load results in a frequency shift which (which is a delay in the time domain), see Theory section and Weissman discloses in the exemplary embodiments, the transmitter 60 provides an alternating current (AC) excitation signal to the sensor 54 via wires 56. The transmitter 60 receives as the output from the sensor 54 its response to the excitation signal (e.g., by variation in load, energy loss, change in resonant frequency, etc. across wires 56). The transmitter 60 then transmits a signal containing information based on the response of the sensor 54 to the exciter/interrogator unit 38 and/or the main circuitry 42, see column 5, lines 45-54).

Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Das et al. "A pressure Sensing acoustic surface wave resonator," 1976 Ultrasonic's Symposium Proceedings, IEEE Cat. No. 76 Ch1120-5SU in view of Weissman et al. (US 6,330,885) and Corl et al. (US 6,767,327) and Overall et al. (US 2004/0260346 with US provisional applications (60/443,938 and 60/473,061).

Regarding claim 18, Das in view of Weissman fails to teach the method wherein a plurality of said devices is employed arranged to operate at different frequencies.

Overall teaches a method of monitoring pressure in the body comprising a plurality of pressure sensor devices is employed arranged to operate at different frequencies [0030], [0040], [0060], [0085] and [0094].

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the method taught by Das in view of Weissman to include a plurality of sensors as taught by Overall in order to detect various dysfunctions of the heart.

Regarding claim 19, Das/Weissman/Corl teaches the method of claim 12 wherein accousitc pressure sensors may be implanted into the body, see Das introduction, and Das/Weissman teaches a (first) SAW sensor device is arranged to measure pressure in the body.

Das in view of Weissman fails to teach the method of monitoring pressure within a human or animal body, wherein a pair of pressure sensors are implanted into the body and a second of the devices being arranged to be insensitive to the pressure and being

operated as a reference device thereby to cancel any effect on the pressure measurement of unwanted parameters.

Overall teaches a method of monitoring pressure in the body comprising a pair of pressure sensor devices is employed wherein a first sensor measure pressure and a second sensor being arranged to be insensitive to the pressure and being operated as a reference device thereby to cancel any effect on the pressure measurement of unwanted parameters [0030], [0040], [0059], [0060], [0085] and [0094].

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the method taught by Weissman to include a plurality of sensors as taught by Overall in order to differentiate heart motion from patient or respiratory motion, see [0059].

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Weissman et al. (US 6,330,885) In view of Corl et al. (US 6,767,327).

Regarding claim 20, Weissman teaches a method of monitoring pressure within a human (pressure gradient, see column 2, lines 25-35) or animal body wherein a surface acoustic wave device is implanted therein or attached thereto (implanted device 32 comprising a sensor 54/54'), wherein the device comprises a pair of interdigitated transducers spaced apart over the surface of a piezo-electric substrate that closes a chamber (see Figures 4-10 and Column 5, line 65 through column 7 line 60, the resonant sensing elements are placed on a piezoelectric material over a chamber , see Figures 8-10, the may include catilever beams or one or more diaphragms, column 7,

lines 45-50), which substrate is exposed to the pressure to be monitored (column 2, lines 26-34), wherein an antenna is connected to one of the interdigitated transducers (60, Column 4, lines 38-48 and 60-58 and column 5, lines 28-53), wherein a radio-frequency signal is supplied externally of the body to the antenna (Column 4, lines 38-48 and 60-58 and column 5, lines 28-53), is transmitted over the substrate surface to the other of the transducers, reflected therefrom back to the said one of the transducers and transmitted from the antenna thereof to a receiver, whereby comparison of the supplied and received signals provides a measurement of the pressure (see at least, Column 4, lines 38-48 and 60-58 and column 5, line 28 through column 6, line 23).

Weissman fails to teach a method of monitoring an internal pressure wherein the sensor diaphragm encloses a sealed chamber.

Corl teaches an implanted pressure sensors wherein the sensor dipahram 79 encloses a sealed cavity 101 which serves as reference pressure chamber and can be filled with a suitable fluid. For example, it can be filled with air to half an atmosphere to provide a partial vacuum. Alternatively, the cavity 101 can be filled to one atmosphere or it can be completely evacuated, see Column 6, lines 24-45.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the method taught by Weissman to include a reference pressure chamber as taught by Corl in order to measure changes in pressure differential across a sensing diaphragm as the differential between an environmental pressure change vs. a given reference pressure, which can then be used to determine relative vs. absolute pressure.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Response to Arguments

Applicant's arguments filed 2/1/2010 have been fully considered but they are not persuasive.

The Applicant argues that Weissman in view of Corl fails the method of claims 12, 16, 17 and 20 because Weissman fails to teach a pressure monitoring device and

that one of ordinary skill would therefor not look to the pressure sensor of Corl and that the space below 72 cannot be considered a chamber because of the cantilever beams.

The Examiner Disagrees.

Weissman in teaches a device configured to measure the dopplar effect or pressure gradient applied to a substrate, see column 2, lines 25-35. Weismann further teaches that the electrodes 70 and 72 are positioned over cavity as shown in Figure 9 and that the cantilever beams may be replaced with a diaphragm, see column 7, lines 45-50. Both Weissman and Corl teach pressure monitoring, therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the method taught by Weissman to include providing a sealed cavity as taught by Corl as set forth in the previous and above rejections.

The Applicants arguments regarding claims 18 and 19 are drawn to limitations of claim 12 which are addressed above.

Contact Info

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL C. STOUT whose telephone number is (571)270-5045. The examiner can normally be reached on M-F 7:30-5:00 Alternate (Fridays).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Max Hindenburg can be reached on 571-272-4726. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. C. S./
Examiner, Art Unit 3736

/Max Hindenburg/
Supervisory Patent Examiner, Art Unit 3736